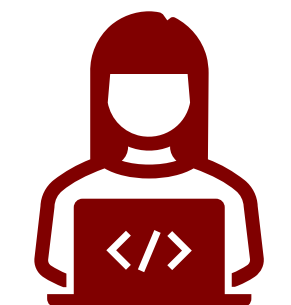




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Objective: The purpose of this multi-methods study was to evaluate the **usage** and **feasibility** of the Communication Bridge-2 web application through complementary quantitative and qualitative data, including app usage data, self-report Likert-scale ratings of enjoyment and benefit to communication, and semi-structured interviews focused on barriers and facilitators of app engagement.

Methods

Participants with PPA enrolled in CB2 (NCT03371706; N=89 completed) were encouraged to complete app-based home practice for 30 minutes per day, five days per week.

Table 1. Data Sources and Measures Used to Evaluate CB2 App Engagement

Data source	Measures used
Participant characteristics	Sex, age, education, PPA subtype, disease duration, severity (WAB-R AQ), depressive symptoms (PROMIS)
App usage logs	Weekly meaningful logins, days used, total exercise completions, completions by exercise type, intervention vs maintenance use
Post-study ratings	Helpfulness and enjoyment ratings for home practice exercises
Post-study interviews	Qualitative feedback on barriers, facilitators, and perceived everyday communication benefit

Table 1. WAB-R AQ = *Western Aphasia Battery-Revised Aphasia Quotient*; PROMIS = *Patient-Reported Outcomes Measurement Information System*

App Usage Cohort (N=89)	Post-Study Interview Cohort (N=78)
❖ Sex: 43 female (48.3%), 46 male (51.7%) ❖ Age: 67 years (7.3; 52.4-81.8) ❖ Education: 16.4 years (2.3; 12-21) ❖ Subtype: 25 PPA-G (28.1%), 40 PPA-L (44.9%), 24 PPA-S (27%) ❖ Disease Duration: 3.69 years (1.81; 1.28-8.63)	❖ Sex: 35 female (44.9%), 43 male (55.1%) ❖ Age: 67.2 years (7.3; 52.4-81.8) ❖ Education: 16.4 years (2.2, 12-21) ❖ Subtype: 20 PPA-G (25.6%), 39 PPA-L (50%), 19 PPA-S (24.4%) ❖ Disease Duration: 3.82 years (1.81; 1.31-8.63)

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Funding: Research reported in this poster was supported by the National Institute on Aging (NIA) of the National Institutes of Health under award numbers F31AG092224, R01AG055425, R56AG055425. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. This study was also supported in part by Run4Papa.

Results

Fig 1. Per-person usage means across the CB2 trial

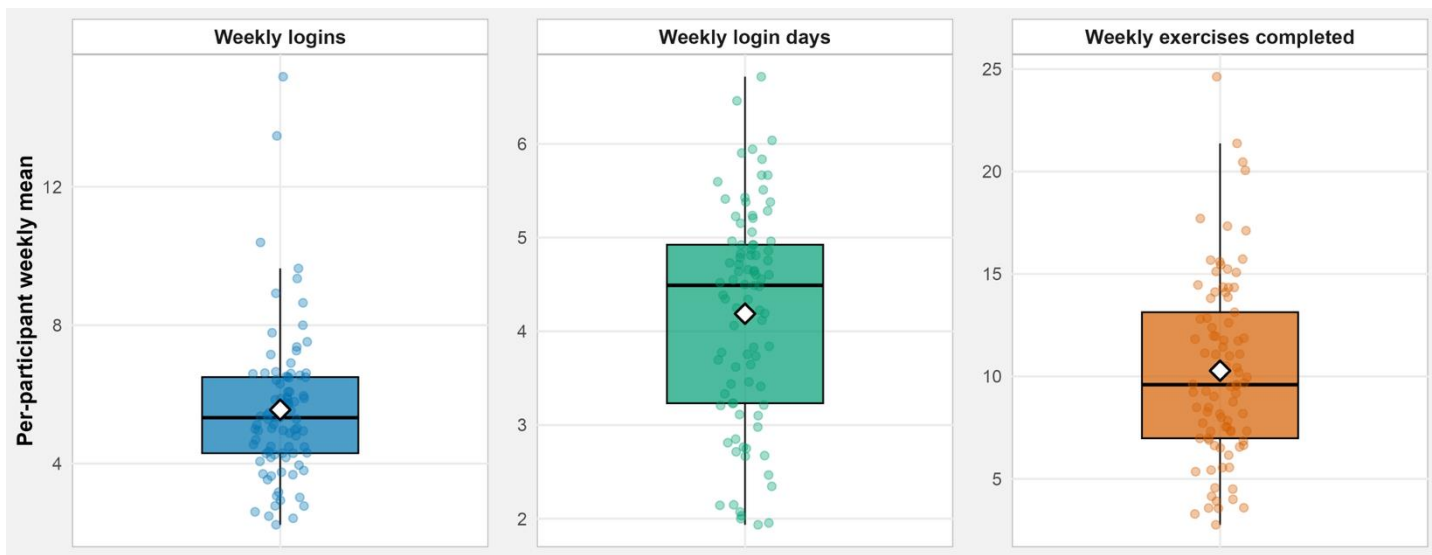


Fig 1. Participants averaged 5.56 weekly logins (SD=1.12), completed 10.28 exercises per week (SD=4.5), and used the app on 3.98 days per week (SD=1.18).

Fig 4. Age and depression associated with app usage

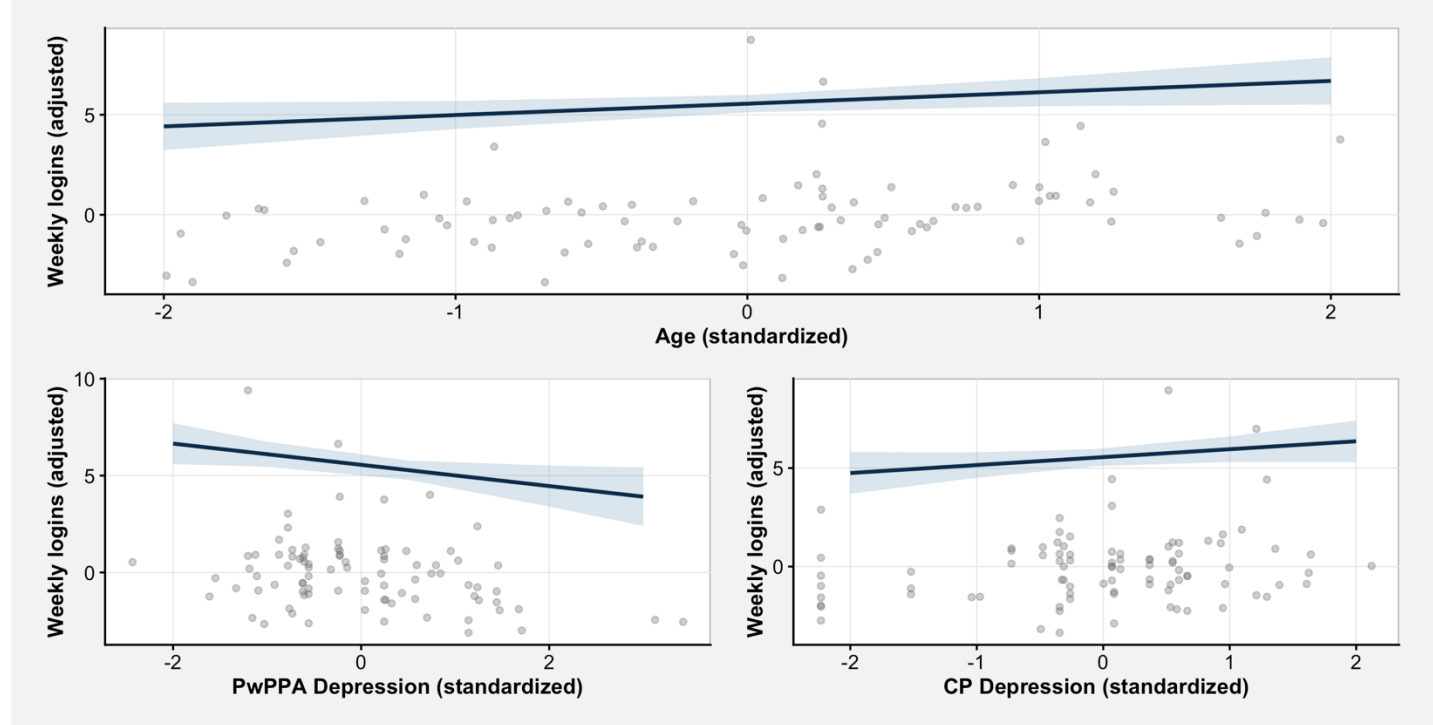


Fig 4. Weekly meaningful logins were significantly higher with older participant age, significantly lower with greater PwPPA depression, and showed a trend toward being higher with greater CP depression.

Fig 2. Usage differed by exercise type

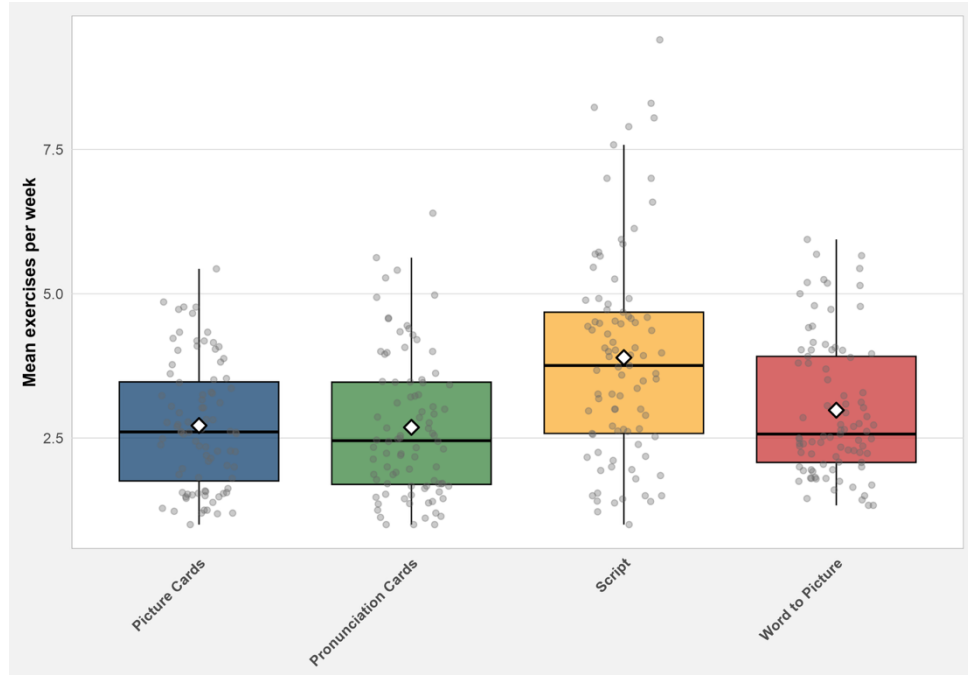


Fig 2. Exercise completion differed by type: Script Practice (M=3.89, SD=1.83), Word-to-Picture Matching (M=2.98, SD=1.19), Picture Cards (M=2.72, SD=1.09), and Pronunciation Cards (M=2.68, SD=1.24), with significantly greater use of Script Practice than the other exercises (p<0.001).

Fig 5. Few reported technical difficulties

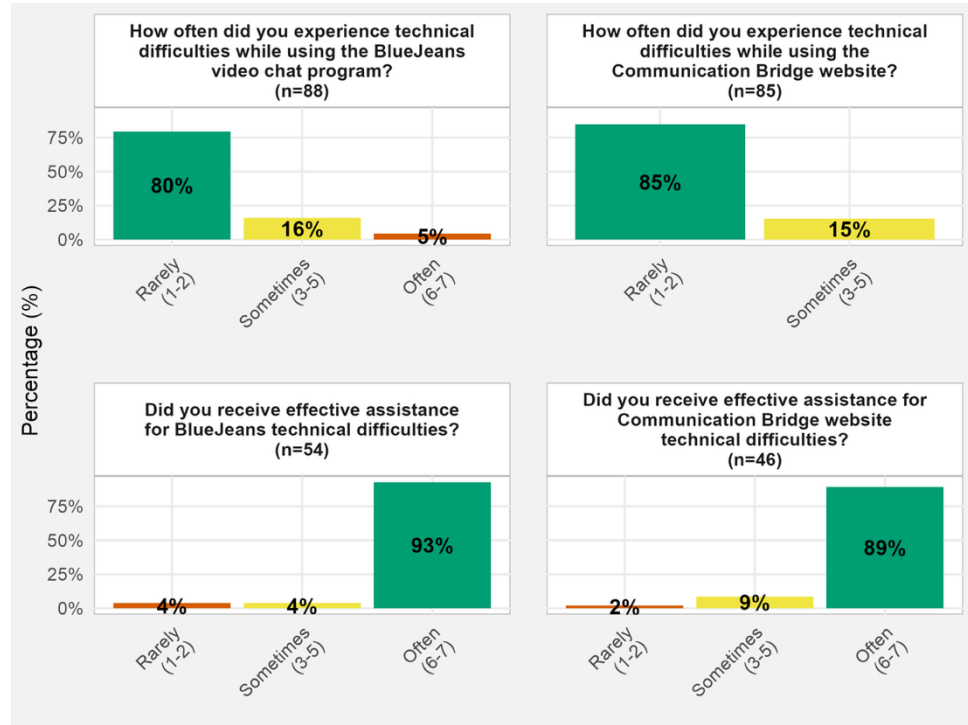


Fig 5. Participants reported infrequent technical difficulties, with highly effective technical assistance when needed.

Fig 3. Usage higher during active, direct intervention blocks

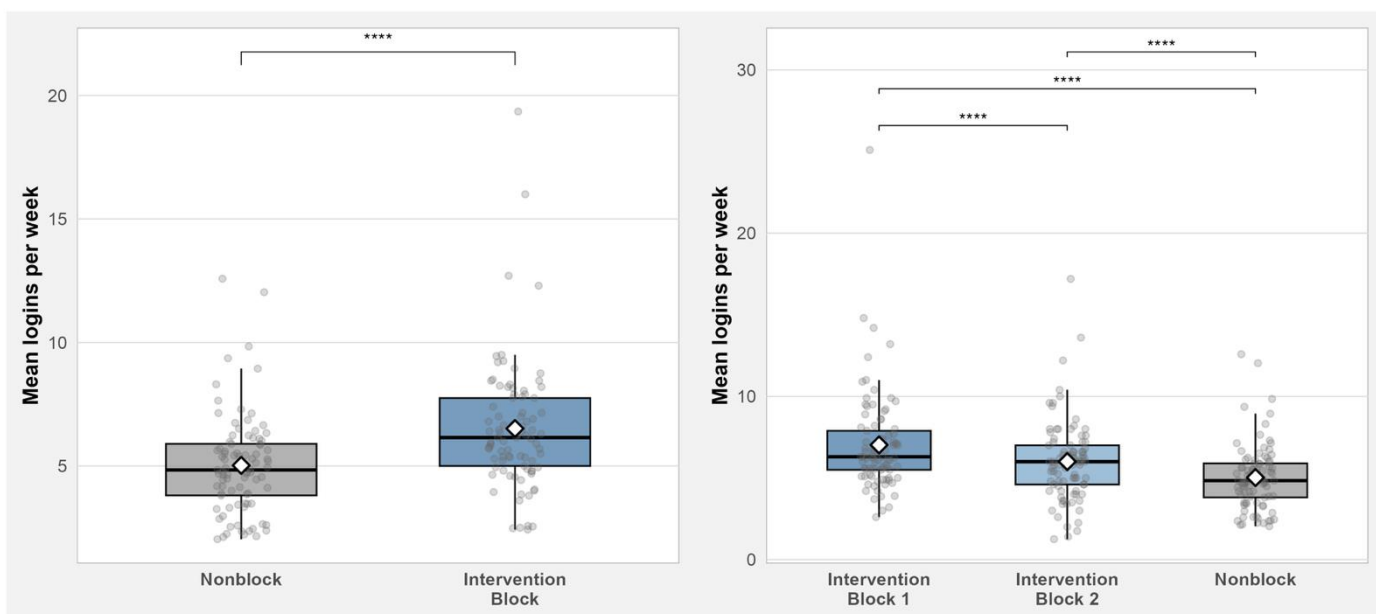


Fig 3. App use was significantly higher during direct intervention blocks than maintenance periods (p<0.001), with use during Intervention Block 1 > Intervention Block 2 > Non-block maintenance periods.

Fig 6. Enjoyment and helpfulness ratings high

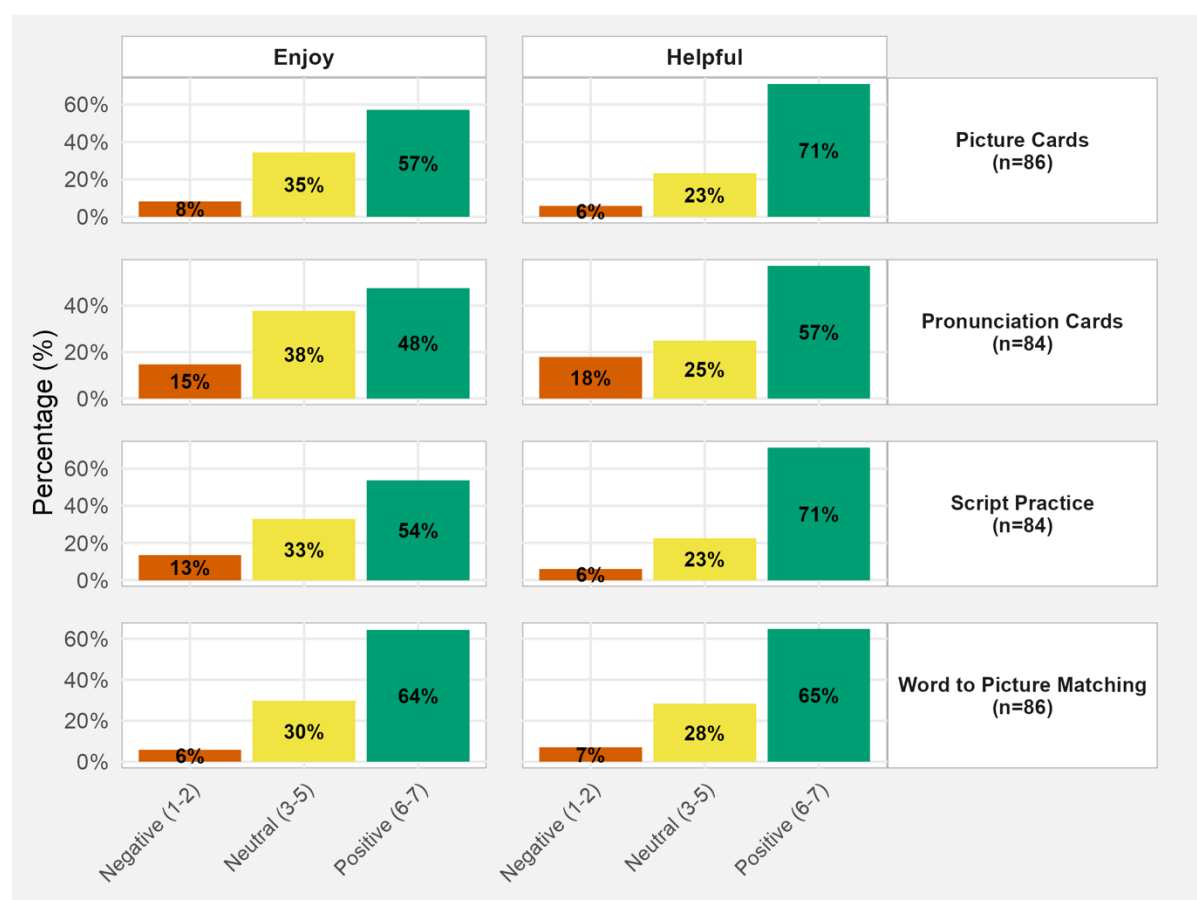
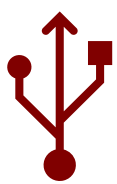


Fig 6. Across exercises, 48-64% of participants provided positive Likert ratings for enjoyment and 57-71% of participants provided positive Likert ratings for helpfulness.

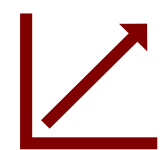
Interview Themes:



Theme 1: Technical obstacles were a primary barrier: hardware challenges, connectivity issues, audio/recording difficulties; varied by severity and experience



Theme 2: Support necessary for feasibility: staff support was the primary mechanism through which technical barriers were resolved; CP support scaffolded access for many participants



Theme 3: Learnability and growing independence: early learning curve that resolved for most within weeks; growing confidence over time



Theme 4: Exercise experience depended on fit, relevance, and repetition: participants varied in how meaningful specific exercises felt, and subtype profile shaped subjective experience despite no group-level differences in engagement.



Theme 5: Active engagement had emotional significance: regular practice supported agency, accomplishment, and routine, but exercises that highlighted decline could also cause frustration.

Key Takeaways

Participants with PPA engaged regularly with app-supported home practice. Findings support acceptable adherence to home practice when paired with **synchronous intervention** and highlight implementation targets, including **improving technical reliability, accessibility, personalized difficulty, and strengthening connections between app practice and everyday communication.**